Dec. 16, 1924. 1,519,946

W. H. WILLIAMS

COMBINATION JACK

Filed June 26, 1922 2 Sheets-Sheet 1

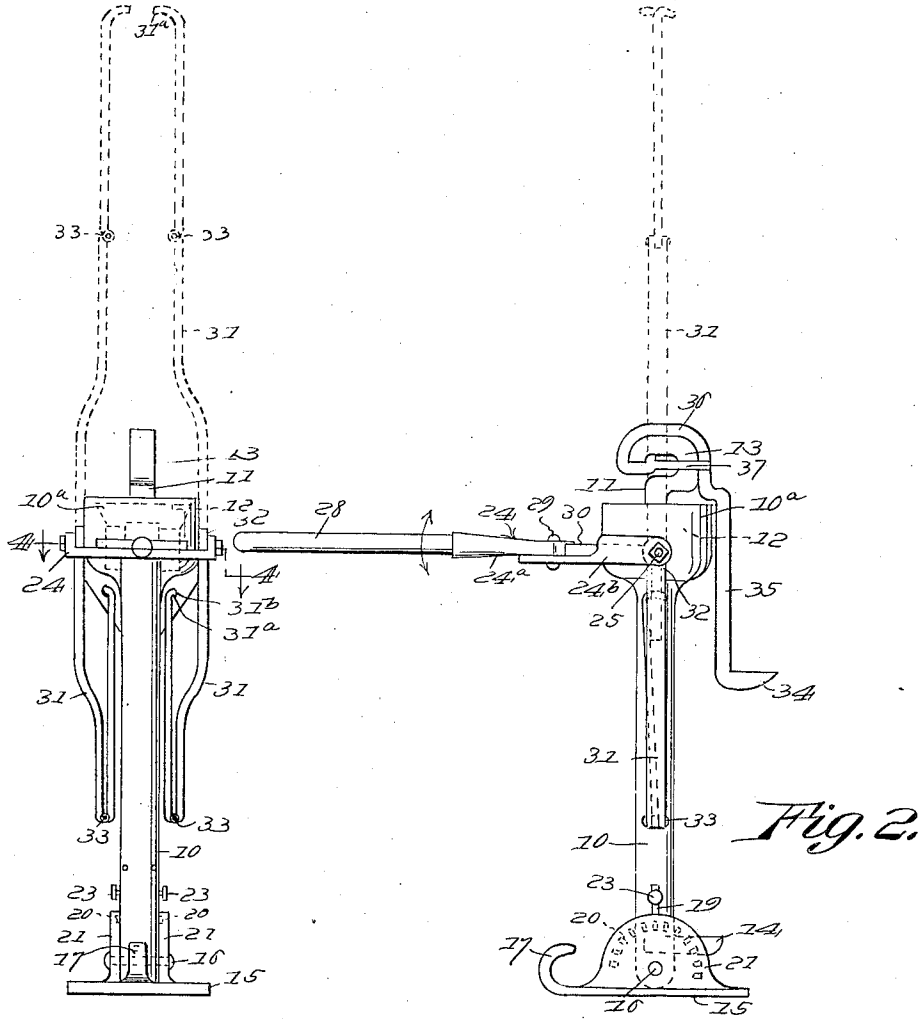


Fig. 1.

Fig. 2.

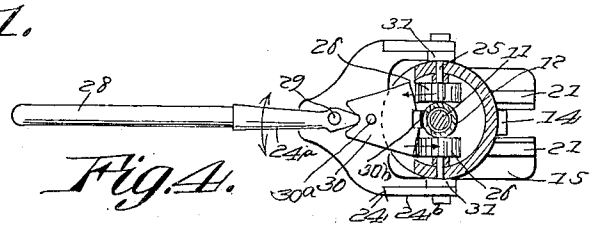


Fig. 4.

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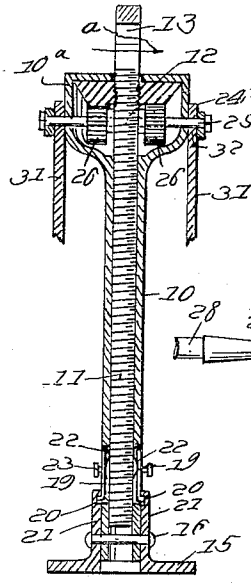


Fig. 3.

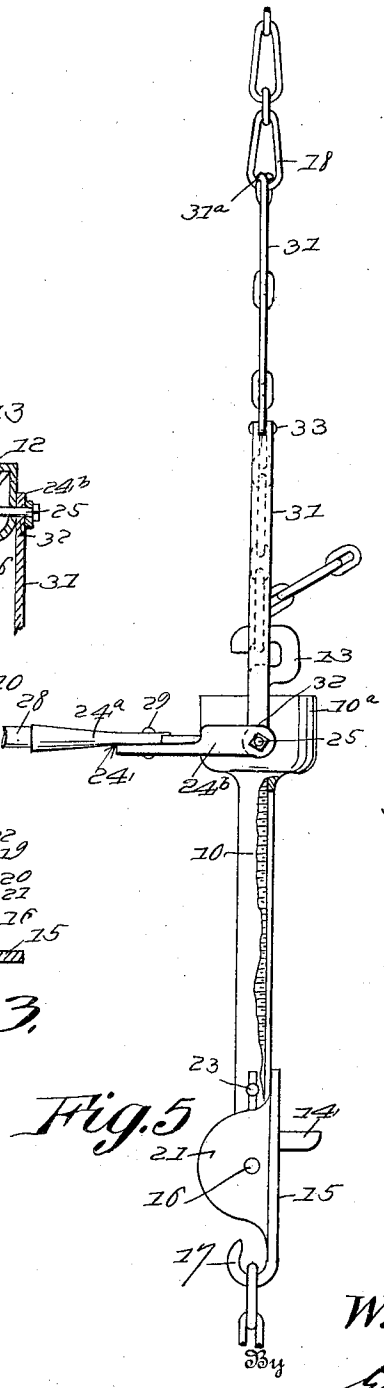


Fig. 5

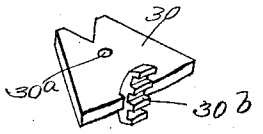


Fig. 6.

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Patented Dec. 16, 1924. 1,519,946

UNITED STATES PATENT OFFICE.

WILLIAM H. WILLIAMS, OF JACOBS CREEK, PENNSYLVANIA.

COMBINATION JACK.

Application filed June 26, 1922. Serial No. 570,833.

To all whom it may concern:

Be it known that WILLIAM H. WILLIAMS, a citizen of the United States of America, residing at Jacobs Creek, in the county of Westmoreland and State of Pennsylvania, has invented new and useful Improvements in Combination Jacks, of which the following is a specification.

The object of the invention is to provide a jack adapted for lifting, pulling and performing like functions in connection with hoisting operations and particularly to provide an apparatus of this type which may readily be converted or re-arranged in the matter of its elements to perform a plurality of functions where power is required with a view to applying the same with the least exertion and inconvenience upon the part of the operator; and with these objects in view the invention consists in a construction and combination of parts of which a preferred embodiment is shown in the accompanying drawings, wherein:—

Figure 1 is a front view, and

Figure 2 is a side view of a device embodying the invention.

Figure 3 is a vertical sectional view of the same.

Figure 4 is a transverse section on the plane indicated by the line 4—4 of Figure 1.

Figure 5 is a view in diagram showing the arrangement of the device as a pulling tool with the anchoring elements engaged with the draft chain to hold the latter in a fixed position during the re-adjustment of the feed screw.

Figure 6 is a detail perspective view of the segment 30.

The device embodies a tubular standard 10 within which is arranged a feed screw 11 engaged by a feed nut 12 and provided terminally with a draft hook 13 and a foot 14. Connected with the standard is a base 15 pivotally connected therewith as at 16 to occupy a position either in transverse or longitudinal relation with the standard and hence with the feed screw and having a draft hook 17 which when the shoe is extended or arranged in longitudinal relation with the standard is adapted to engage an anchoring object toward which it is desired to draw another object having connection with the draft hook 13 of the feed screw through the agency for example of a draft chain 18 or its equivalent as indicated in Figure 5, said draft chain preferably having links as indicated.

For holding the shoe in its adjusted positions either transversely or longitudinally or at any intermediate angular adjustment where the supporting surface upon which the same rests is not level or horizontal or is not perpendicular to the direction of lift when the tool is used as a jack, there is employed a locking means consisting of dogs 19 mounted on the standard for engagement with teeth or seats 20 in the up-standing ears 21 of the shoe or base and yieldingly held in engaging relation therewith by springs 22 or the equivalents thereof. These dogs are provided with buttons 23 by pressure upon which it is possible to disengage the dogs to permit of angular adjustment of the shoe or base with reference to the standard.

The illustrated means for actuating the feed nut consists of an oscillatory lever 24 fulcrumed upon a transverse shaft 25, said lever being of yoke or forked form as indicated, gears 26 being also mounted upon said shaft 25 and in mesh with the gear teeth of the feed nut, together with means carried by the lever for selectively engaging the gears 26 to communicate motion in opposite directions to the feed nut so as to turn the latter respectively in opposite directions and thereby either advance or retract the feed screw. As illustrated the operating lever is of jointed construction having a socket member 24^a adapted for the reception of a handle 28, and a head or yoke member 24^b fulcrumed as above noted on the shaft 25, said socket or operating member being pivotally connected with the head or yoke member by means of a pivot 29 which is disposed in perpendicular relation with the axis of the shaft 25 so as to permit the operating or socket member to swing laterally with reference to the path of swinging movement of the lever on its fulcrum 25. Said operating or socket member engages a segmental head or pawl 30 (which is pivoted at 30^a to the lever 24) for selective engagement with the teeth of the gears 26 and adapted to be engaged with either by a lateral swinging movement of the operating or handle member. Thus by alternate lateral swinging movements of the handle member of the lever with intermediate swinging movement about the fulcrum 25, a step by step rotary movement may be applied to one of the gears

26 to thereby cause a feeding movement of the nut 12 and feed screw to either draw or push an object with which the tool may be engaged as above indicated. In using the apparatus for hoisting or in pulling, which necessitates the inward movement of the feed screw, should a single stroke of the latter, limited obviously by its length, be insufficient to move the object the required distance, the chain 18 or its equivalent which is connected with the object being drawn may be held during a re-adjustment of the feed screw by means of anchor arms 31 pivotally mounted upon the head 32 which is carried by the standard and serves as a housing for the gear members, said anchor arms preferably being intermediately jointed as shown at 33. The use of these arms is indicated in Figure 5.

In the illustrated embodiment of the invention the anchor arms 31 as indicated in full lines in Figures 1 and 2 are foldable with the outer or free sections thereof doubled back when the said arms are not in use so that the terminal hooks 31^a thereof are adapted for engagement with seats 31^b in the head 10^a of the standard so that in this position the said anchor arms serve as side handle by which the jack may be transported, the inner ends of the arms being mounted upon the transverse shaft 25 which serves as the fulcrum for the operating lever 24.

Furthermore an intermediate lifting shoe 34 is provided for attachment when the object to be raised affords a purchase at an elevation which is intermediate of the height of the standard and therefore is above the level suitable for the shoe or foot 14, said supplemental lifting shoe having a stem or shank 35 provided with a terminal hook 36 for engagement with the hook 13 at the upper end of the feed screw as indicated in Figure 2. Side straps 37 serve to prevent transverse displacement of the auxiliary lifting shoe with relation to the hook 13. In the operation, when employing the foot 14 (which is carried terminally by the feed screw 11), the foot may be placed under an object to be raised. In this instance, the suplemental lifting shoe is detached from the jack. The handle 28 is then oscillated vertically but prior to the upward initial movement of the handle or lever 28, the socket member 24^a is oscillated to shift the segment on its pivot 30^a until its teeth 30^b engage with the pinion 26 to the right of the feed screw 11. Obviously, upon imparting this initial movement to the lever or handle 28 and since the teeth of the segment 30 engage those of the pinion at the right of the feed screw, said pinion 26 rotates and imparts movement to the feed nut 12 in the direction of the arrow *a* in Figure 3. At the end of the vertical movement of the lever or handle 28 and instantly before said lever is moved downwardly, the socket member 24^a is oscillated in the opposite direction, tilting the segment 30 on its pivot 30^a so that the teeth 30^b of the segment may engage with the gear or pinion 26 at the left of the feed screw 11, thereby imparting movement to this last mentioned pinion and hence keeping up the movement of the feed nut 12 in a direction continuous with the previous direction of rotation. This operation of the handle or lever causes the feed screw 11 to ascend and since the foot 14 is carried by the terminal portion of the feed screw, the foot will endeavor to raise an object to be lifted.

When using the supplemental lifting shoe, said shoe is suspended on the draft hook 13 at the upper terminal portion of the feed screw in the manner illustrated in Figure 2, the foot 34 being then engaged under an object to be lifted. The feed screw is operated in a similar manner to that when using the foot 14. By oscillating the lever or handle 28 and reversing the movement of the gears 26 by reversing the period of shifting the segment 30 according to the direction of oscillation of the handle or lever 28, the feed screw may be lowered.

As previously described, the standard 10 is mounted upon a base 15, the former being capable of pivotal adjustment relative to the base, by simply depressing the buttons 23, and disengaging the noses of the dogs 19 from the seats 20. When making this pivotal adjustment, the base 15 may assume the position as in Figure 5. When in such a position, a chain may be connected to the draft hook 17. Another draft chain 18 may be connected to the draft hook 13 which is a part of the feed screw. Obviously, by imparting movement to the handle or lever 28 so as to recede the feed screw into the standard, the two draft chains may be drawn together or, if one draft chain is fixed and the other capable of movement, the latter may be drawn toward the former. When operating the device in this manner, the anchor arms 31 are unfolded, the terminal hooks 31^a being removed from their sockets in webs at the base of the head 10^a, after which the anchor arms are disposed as shown in dotted lines in Figure 1, so that the terminal hooks 31^a may engage with the chain 18 as in Figure 5, so as to reinforce the jack in its position as disclosed in Figure 5.

Having described the invention, what is claimed as new and useful is:—

1. A jack having a standard, a feed screw movable longitudinally of the standard, a revoluble feed nut engaging the feed screw and carried by the standard, and means for actuating the feed nut, the standard being provided at its lower end with anchoring

means and the feed screw being provided at the opposite end with chain engaging means, and anchoring arms carried by the standard for terminal engagement with a chain engaged by said screw carried hook.

2. A jack having a standard, a feed screw movable longitudinally of the standard, a revoluble feed nut engaging the feed screw and carried by the standard, and means for actuating the fed nut, the standard being provided at its lower end with anchoring means and the feed screw being provided at the opposite end with chain engaging means, and anchoring arms carried by the standard for terminal engagement with a chain engaged by said screw carried hook, said arms being jointed and being pivotally mounted upon the standard.

3. In a device as set forth, the combination with male and female telescopically united extensible members, of a feed element carried by the latter member for operating the members extensibly, selectively operated devices for imparting movement to the feed element, a terminal hook carried by the male member and provided with a draft chain connected thereto, a base mounted for pivotal adjustment on one end of the female member remote from the terminal hook and provided with a draft hook for attachment to a second draft element, and opposed depressible dogs carried by the female member and operatively engaging with parts of the base for holding the base in different positions.

4. In a device as set forth, the combination with male and female extensibly connected members, of a feed element carried by the female member and operatively connecting with the male member for imparting extensible movement to the latter, a pair of rotating devices for cooperation with the element, a lever oscillatory vertically and provided with a pivotal segment for selective engagement with one or the other of the devices for imparting movement to the element, a second element pivoted on the lever and provided with a tooth and notch engagement with the segment for oscillating the latter, and means carried by one or the other of the terminals of the male member for engagement with an object to be lifted.

5. In a device as set forth, the combination with male and female extensibly connected members, of a feed element carried by the female member and operatively connecting with the male member for imparting extensible movement to the latter, a pair of rotating devices for cooperation with the element, operating means including a second element for selective engagement with either one of the devices whereby continuous rotating movement may be imparted to the feed element to feed the male member in one direction or the other, a base mounted for pivotal adjustment on one end of the female member, means including depressible dogs for operative engagement with parts of the base for holding the base in different adjusted positions relative to the female member, and means carried by one of the ends of the male member for engagement with an object to be lifted.

6. In a device as set forth, the combination with male and female extensibly connected members, of a feed element carried by the female member and operatively connecting with the male member for imparting extensible movement to the latter, a pair of rotating devices for cooperation with the element, operating means including a second element for selective engagement with either one of the devices whereby continuous rotating movement may be imparted to the feed element to feed the male member in one direction or the other, one end of the male member having a draft hook; a lifting shoe provided at one end with a lifting foot and at the other end with a terminal hook conforming to and engaging the hook of the male member, and means carried by the hook of the lifting shoe for cooperation with the first hook to prevent transverse displacement of the lifting shoe.

7. In a device as set forth, the combination with male and female extensibly connected members, of a feed element carried by the female member and operatively connecting with the male member for imparting extensible movement to the latter, a pair of rotating devices for cooperation with the element, operating means including a second element for selective engagement with either one of the devices whereby continuous rotating movement may be imparted to the feed element to feed the male member in one direction or the other, an object engaging lifting means carried by one end of one of the members for engagement with an object to be lifted, and anchor arms pivotally mounted at one end of the female member, said anchor arms comprising folding sections, certain of which are provided with terminal hooks, said folding sections of the arms being extensible in the same general direction with the operating means, whereby the terminal hooks of certain of the sections may engage with a draft member so that the lifting means may raise an object to be lifted, one end of the female member having seats for the reception of the terminal hooks of the folding anchor arms.

In testimony whereof he affixes his signature.

WILLIAM H. WILLIAMS.